

1.1, I. The Nature of Science

A. Where is science?
→ all around us

B. Pure science - performing a study or experiment for the sake of knowledge

C. Applied science - performing a study or experiment to solve or gain information regarding a specific problem

D. Technology - the practical use of scientific knowledge/info

E. Major categories of science: life science, Earth Science, and physical science (physics, chemistry)

II Physical Science - the study of matter and energy

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A. Every measurable thing in the universe is either matter or energy

1. Matter examples: plants, rocks, animals, trees

2. Energy examples: lightning, motion

→ 3 questions that can be answered w/ physical science

Phys science 1.1 review

Grade:

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1 Which is not a major category of physical science?

- A life science
- B computer science
- C earth science
- D physics

2 Conducting research to investigate the spread of blue tongue in cattle would be an example of pure science.

- True
- False

Phys science 1.1

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3 Every measurable thing in the universe is either matter or energy

- True
- False

1.2 Science - the business of solving problems

- A. Solving problems involves finding missing information
 - 1. Looking for patterns help solve problems
- B. Plan a strategy to solve a problem
 - 1. Look for patterns that will help you make predictions about the problem

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- a. Problem - a method of solution must be developed
- b. Exercise - method of reaching the solution is known
- 2. Develop a model
 - a. A model is an idea, system, or structure that represents what you are trying to solve
- 3. Break the problem down into smaller, simpler problems

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- 4. When you arrive at a solution, revisit the original problem and see if your solution makes sense
- C. What is critical thinking?
 - 1. Critical thinking is a process that uses certain skills to solve a problem

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- E. Scientific Method - solving problems the scientific way
 - 1. Observation - first step in scientific method, which is using your senses to gather information
 - a. good observations lead to testable predictions
 - 2. Hypothesis - a testable prediction

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- 3. Testing the hypothesis - it is never possible to prove a hypothesis is absolutely correct. However can support a hypothesis
- F. Theories and Laws
 - 1. Scientists use information that they gather during experiments to form a theory

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2. Theory - an explanation based on many observations^{supported} by experimental results
- a. a theory is the most logical rationale of why things work the way they do
3. Law - a rule of nature that sums up related observations and experimental results to describe a pattern of nature

Phys science 1.2 review

Grade:

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1 When the method for reaching the solution is known, this is called

- A a question
- B an exercise
- C a problem

2 It is always possible to prove a hypothesis is absolutely right.

- True
- False

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3 Using your senses to gather information is known as a...

- A theory
- B hypothesis
- C observation

4 A rule of nature that sums up related observations and experimental results to describe a pattern of nature is a scientific law.

- True
- False

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1.3, I. Technology makes it real

- A. Technological advances has made special effects in today's movies more convincing than ever
- B. 3 ways technological advances have made movies more convincing
 - 1. better and more accurate models, new materials for props, and computer graphics

1.4 Scientifically Tested

I. What do scientists do?

- A. ^{*}Scientists gather information from observations, look for patterns, form hypotheses, test their hypotheses w/ experiments, analyze results, draw conclusions, and communicate results

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What is an experiment?

1. Experiment - an organized procedure for testing a hypothesis.
a. when doing an experiment, it is important to follow specific guidelines in order to obtain the most accurate conclusions.

2. Control - a standard for comparison
a. a control is important in an experiment because it shows that your result is related to the condition you're testing and not to some other condition.

3. Constant - a factor that doesn't vary in an experiment.
a. it is important to keep factors constant in order to most clearly see the effects of the variable being manipulated.

4. Independent Variable - the factor adjusted by the experimenter.

5. Dependent Variable - is a factor whose value depends on the value of the independent variable.

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C. Steps in an Experiment

1. Determine the problem, what do you want to find out?
2. Make a hypothesis. What prediction do you want to test?
3. Test your hypothesis. What steps can you take to reach a conclusion about your hypothesis?

4. Analyze the results. What happens during your experiment?

5. Draw Conclusions.
do your observations and data suggest that your hypothesis is supported?

III. Design an experiment to determine the fastest route from your home to your school!

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Chapter 1 Review

Grade: 8th
Subject: Physical Science
Date: 8/30/12

1 The study of science for the sole purpose of advancing our knowledge is called _____ science

- A experimental
- B hypothetical
- C pure
- D applied

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2 Which is the final step in an experiment?

- A reach a conclusion
- B state the problem
- C set up a procedure
- D record data

3 An experiment is used for testing a _____

- A theory
- B law
- C model
- D hypothesis

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4 A _____ is an explanation supported by experimental results.

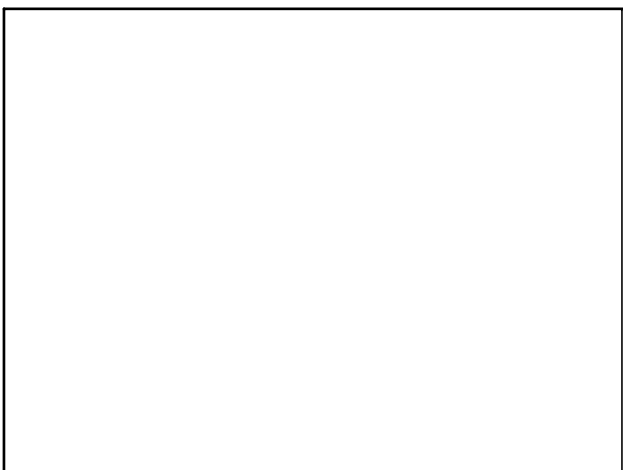
- A conclusion
- B scientific law
- C theory
- D mdoel

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5 A scientific _____ is sometimes called a rule of nature

- A theory
- B law
- C model
- D hypothesis

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